

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

1. (Original) A process for producing a single-walled carbon nanotube by a vapor deposition technique, comprising:

a step of spraying a solution prepared by dissolving an organic metal compound in an organic solvent into a furnace of a rare gas atmosphere,

a step of vaporizing the organic metal compound and the organic solvent each described above by heating the sprayed solution,

a step of heating and decomposing the vaporized organic metal compound to obtain metal and heating and decomposing the vaporized organic solvent with the metal described above being used as a decomposition catalyst to obtain carbon atoms and

a step of growing a graphene sheet using the carbon atoms obtained.

2. (Original) The process for producing a single-walled carbon nanotube as described in claim 1, wherein a pressure in the furnace is controlled to 760 Torr or less.

3. (Original) The process for producing a single-walled carbon nanotube as described in claim 2, wherein a pressure in the furnace is controlled to 500 Torr or less.
4. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 3~~ claim 1, wherein the organic solvent is alcohol.
5. (Original) The process for producing a single-walled carbon nanotube as described in claim 4, wherein the alcohol is ethanol.
6. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 5~~ claim 1, wherein the organic metal compound is metallocene.
7. (Original) The process for producing a single-walled carbon nanotube as described in claim 6, wherein the metallocene is ferrocene.
8. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 7~~ claim 1, wherein the organic metal compound contained in the solution prepared by dissolving the organic metal compound in the organic solvent has a concentration of 0.01 to 1 mass %.
9. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 8~~ claim 1, wherein the solution described above which is pressurized by an inert gas having a back pressure of 100 to 1000 Torr is sprayed through a nozzle having an aperture diameter of 0.01 to 1 mm.

10. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 9~~ claim 1, wherein a heating temperature for vaporizing the organic solvent and the organic metal compound is 50 to 600°C.

11. (Currently Amended) The process for producing a single-walled carbon nanotube as described in claim 10, wherein a heating temperature for vaporizing the organic solvent and the organic metal compound is 100 to 400°C.

12. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 11~~ claim 10, wherein a heating temperature for heating and decomposing the organic solvent and the organic metal compound is 550 to 1000°C.

13. (Currently Amended) The process for producing a single-walled carbon nanotube as described in claim ~~12-11~~, wherein a heating temperature for heating and decomposing the organic solvent and the organic metal compound is 700 to 1000°C.

14. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 13~~ claim 12, wherein a temperature for growing the graphene sheet is lower than a temperature of heating the organic solvent.

15. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 14, wherein the inert gas is argon or helium.~~ claim 13, wherein a temperature for growing the grapheme sheet is lower than a temperature of heating the organic solvent.

16. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 15, wherein 5 mass % or less of hydrogen gas is mixed with the inert gas.~~ claim 9, wherein the inert gas is argon or helium.

17. (Currently Amended) The process for producing a single-walled carbon nanotube as described in ~~any of claims 1 to 16, wherein the single-walled carbon nanotube comprising the grown graphene sheet is collected by a membrane filter.~~ claim 9, wherein 5 mass % or less of hydrogen gas is mixed with the inert gas.

18. (Currently amended) ~~Equipment for producing a single-walled carbon nanotube by a vapor deposit technique, comprising:~~

~~—— a nozzle for spraying a solution prepared by dissolving an organic metal compound in an organic solvent by pressurizing with an inert gas having a prescribed back pressure,~~

~~—— a pre-heating part for vaporizing the organic metal compound and the organic solvent each described above by heating the sprayed solution,~~

~~—— a main heating part for heating and decomposing the organic metal compound vaporized in the pre-heating part and heating and decomposing the organic solvent vaporized in the pre-heating part with the metal obtained by heating and decomposing the organic metal compound being used as a catalyst,~~

~~—— a growing part for growing a graphene sheet using carbon atoms obtained by heating and decomposing the solvent described above in the main heating part,~~

~~—— a first controlling means for heating and maintaining a temperature of the furnace in the pre-heating part described above at 50 to 600°C,~~

~~—— a second controlling means for heating and maintaining a temperature of the furnace in the main heating part described above at 550 to 1000°C and~~

~~—— a third controlling means for maintaining the pre-heating part, the main heating part and the growing part in a rare gas atmosphere.~~ The process for producing a single-walled carbon nanotube as described in claim 1, wherein the single-walled carbon nanotube comprising the grown graphene sheet is collected by a membrane filter.

19. (New) Equipment for producing a single-walled carbon nanotube by a vapor deposit technique, comprising:

a nozzle for spraying a solution prepared by dissolving an organic metal compound in an organic solvent by pressurizing with an inert gas having a prescribed back pressure,

a pre-heating part for vaporizing the organic metal compound and the organic solvent each described above by heating the sprayed solution,

a main heating part for heating and decomposing the organic metal compound vaporized in the pre-heating part and heating and decomposing the organic solvent vaporized in the pre-heating part with the metal obtained by heating and decomposing the organic metal compound being used as a catalyst,

a growing part for growing a graphene sheet using carbon atoms obtained by heating and decomposing the solvent described above in the main heating part,

a first controlling means for heating and maintaining a temperature of the furnace in the pre-heating part described above at 50 to 600°C,

a second controlling means for heating and maintaining a temperature of the furnace in the main heating part described above at 550 to 1000°C and

a third controlling means for maintaining the pre-heating part, the main heating part and the growing part in a rare gas atmosphere.